

# Andrea Mattera



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## EDUCATION

### Advanced school in Artificial Intelligence

I attend the advanced school in Artificial Intelligence organized by the Institute of Cognitive Sciences and Technologies (ISTC) of the National Research Council (CNR), in order to gain knowledge of computational and robotic models of the brain. My goal is to apply a top-down approach to gain insights into the mechanisms of psychiatric diseases and to develop theoretical models that could guide further experimental researches.

### Ph.D.

I gained my Ph.D. in Neuroscience in 2018 at Università Cattolica del Sacro Cuore (UCSC), Faculty of Medicine and Surgery "Agostino Gemelli", discussing a thesis entitled "Alterazioni della funzione sinaptica in modelli sperimentali di leptino- e insulino-resistenza cerebrale (Alterations of synaptic function in experimental model of brain leptin- and insulin-resistance)". My thesis supervisor was Professor Claudio Grassi.

### Laboratory activity

During my Ph.D. I investigated synaptic transmission and plasticity in brain slices of rodents subjected to an high-fat diet. In particular, I performed electrophysiological experiments (patch clamp and field recordings) to study how diet influences hippocampal activity, using ex vivo acute slices and organotypic cultures.

The results produced during my Ph.D. have been published in 3 articles in the journals Cerebral Cortex, Nature Communication and Frontiers in Cellular Neuroscience.

### Master's Degree at University of Rome "La Sapienza"

I graduated in 2013 with 110/110 cum laude and high honors (Bacio Accademico). I discussed an experimental thesis entitled: "Physical activity rescues adult hippocampal neurogenesis in a mouse model of impaired proliferation". My thesis supervisor was Dr. Emanuele Cacci.

### Laboratory Activity

I attended the laboratory of Dr. Felice Tirone at the National Council of Research (CNR) for a year under the tutoring of Dr. Stefano Farioli Vecchioli, where I worked at an experimental thesis about the effect of running on neurogenesis in the Btg1 knockout model. I presented my data in a poster at the congress Eurogenesis (Bordeaux, 24-26 June 2013), and I published them in a paper in the journal Stem Cells as co-first author.

### Bachelor's Degree at University of Naples "Federico II"

I graduated in Biology in 2009 with 110/110 cum laude discussing an experimental thesis entitled: "Effetto pro-apoptotico di frazioni di diatomee sulla gonade di *Hippolyte inermis*

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(Pro-apoptotic effect of diatom fractions on the gonad of *Hippolyte inermis*".

### **Laboratory activity**

I worked for eight months (2008-2009) under the supervision of Dr. Valerio Zupo at the Zoological Station Anton Dohrn, in Naples. In this period I studied *Hippolyte inermis*, a proterandric decapod living in the marine prairies of *Posidonia oceanica*. I focused on the premature sexual inversion induced by a diet enriched with different fractions of the diatom *Cocconeis scutellum*. The altered sex ratio in the decapod cultures exposed to the different diets was analyzed with Student's *t* test and ANOVA.

### **Knowledge of spoken and written english:**

B2 degree, British Institute Roma Prati, 20/06/2018

### **Computer skills**

- Knowledge of C and Python programming languages.
- Excellent knowledge of Windows operating system; good knowledge of Linux.
- Advanced knowledge of Microsoft Excel, Open Office and of the vector graphics editor CorelDraw.

### **Courses taken**

- "Programming fundamentals", Duke University through Coursera
- "Writing, running and fixing your code in C", Duke University through Coursera
- "Pointers, arrays and recursions", Duke University through Coursera
- "Getting started with Python", Michigan University through Coursera
- "Python data structures", Michigan University through Coursera
- "Python 3 tutorial course", SoloLearn
- "Calculus One", Ohio State University through Coursera
- "Python e Machine Learning (Python and Machine Learning)", FabLab Roma Makers
- "Arduino e Oltre (Arduino and Beyond)", FabLab Roma Makers
- "Corso professionale di Arduino, livello avanzato (Professional course of Arduino, advanced level)", FabLab Roma Makers
- "L'uso della statistica nella ricerca biomedica (The use of statistics in biomedical research)", C.E.R.C. Roma

### **Exams taken**

#### **Exams taken for my Master's Degree program**

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|---|-----------------|
| ▪ Methods of study of the nervous system              | 30/30 cum laude |
| ▪ Mechanisms of signal transduction                   | 30/30           |
| ▪ Comparative neuroanatomy                            | 30/30 cum laude |
| ▪ Developmental neurobiology                          | 30/30           |
| ▪ Neurophysiology of the cell and of the sense organs | 30/30 cum laude |
| ▪ Psychobiology                                       | 30/30 cum laude |
| ▪ Psychopharmacology                                  | 30/30 cum laude |
| ▪ Methods in behavioral research                      | 30/30 cum laude |
| ▪ Proteomics  | 30/30           |
| ▪ Paleoanthropology                                   | 30/30 cum laude |



### Exams taken for my Bachelor's Degree program

▪ Mathematics	30/30
▪ Physics	30/30
▪ General and inorganic chemistry with laboratory	28/30
▪ Organic chemistry with laboratory	26/30
▪ Animal and plant cytology and histology	30/30
▪ Developmental biology and animal phylogeny	30/30
▪ Plant biology	28/30
▪ Animal biology	27/30
▪ Biochemistry	30/30 cum laude
▪ Plant physiology	30/30
▪ Microbiology	28/30
▪ Genetics	28/30
▪ Molecular biology	30/30
▪ General physiology	30/30
▪ Animal biodiversity	24/30
▪ Plant biodiversity	30/30
▪ Ecology	30/30 cum laude
▪ Applied ecology	27/30
▪ Plant physioecology	30/30
▪ Neurobiology	30/30
▪ Molecular markers	30/30
▪ Environmental microbiology and hygiene	30/30
▪ History of science	30/30
▪ English language	Passed
▪ English language II	Passed
▪ Laboratory safety course	Passed
▪ Physical chemistry	Passed

### PUBLICATIONS

- Aceto G.\*, Re A., Mattera A., Leone L., Colussi C., Rinaudo M., Scala F., Gironi K., Barbati S.A., Fusco S., Green T., Laezza F., D'Ascenzo M., Claudio G. (2018) GSK3 $\beta$  modulates timing-dependent long-term depression through direct phosphorylation of Kv4.2 channels. *Cerebral Cortex*, bhy042. Doi: 10.1093/cercor/bhy042.
- Spinelli M.\*, Fusco S., Mainardi M., Scala F., Natale F., Lapenta R., Mattera A., Rinaudo M., Li Puma D.D., Ripoli C., Grassi A., D'Ascenzo M., Grassi C. (2017) Brain insulin resistance impairs hippocampal synaptic plasticity and memory by increasing GluA1 palmitoylation through FoxO3a. *Nature Communication*, 8(1): 2009. Doi: 10.1038/s41467-017-02221-9.
- Mainardi M.\*, Spinelli M., Scala F., Mattera A., Fusco S., D'Ascenzo M., Grassi C. (2017) Loss of leptin-induced modulation of hippocampal synaptic transmission and signal transduction in high-fat diet-fed mice. *Frontiers in Cellular Neuroscience*, 11:225. Doi: 10.3389/fncel.2017.00225.
- Farioli-Vecchioli S.\*, Mattera A.\*, Micheli L., Ceccarelli M., Leonardi L., Rouault J.P., Tirone F. (2014) Running rescues defective adult neurogenesis by shortening the cell cycle length of neural stem and progenitor cells. *Stem Cells*, 32: 1968. Doi: 10.1002/stem.1679

- Farioli-Vecchioli S.\*, Ceccarelli M.\*, Sarauli D.\*, Micheli L., Cannas S., D'Alessandro F., Scardigli R., Leonardi L., Cinà I., Costanzi M., Mattera A., Cestari V., Tirone F. (2014) Tis21 is required for adult neurogenesis in the subventricular zone and for olfactory behavior regulating cyclins, BMP4, Hes1/5 and Ids. *Frontiers in Cellular Neuroscience*, 8:98. Doi: 10.3389/fncel.2014.00098

## WORKING EXPERIENCES

- January 2018-October 2018: university tutor for the course of Human Physiology at the faculty of Medicine and Surgery, UCSC Rome.
- January 2018-March 2018: contract of collaboration with UCSC Rome, for the realization of electrophysiological recording of neuroplasticity in mouse motor cortex after transcranial direct current stimulation. The data produced during the project, founded by Fondazione Roma, have been collected into an article that is currently being submitted to the journal "Brain Stimulation".
- October 2013-March 2014: laboratory technician for the company Neurochlore, owned by Dr. Yehezkel Ben-Ari, Marseille (FR).

Rome, 12/12/2018

